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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,158	06/24/2005	Jun Takada	042721	5031

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EXAMINER

MAI, NGOCLAN THI

ART UNIT	PAPER NUMBER
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1793

MAIL DATE	DELIVERY MODE
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12/14/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/509,158

Applicant(s)

TAKADA ET AL.

Examiner

Ngoclan T. Mai

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 9/28/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being obvious over Takada et al (WO01/182276) in view of Fukasawa et al (U.S. Patent No. 4,514,234). The former reference has an English version which can be seen in U.S. Patent No. 6,589,368 and from which the following rejection is formulated.

Regarding claims 1 and 5, Takada discloses a process for providing high toughness and strength to refractory metal-based alloy material comprising a parent phase consisting of one element selected from Mo, W, and Cr and a nitride of metal element selected from Ti, Zr, Hf, Nb and Ta incorporated into the alloy worked piece wherein the method comprises subjecting a refractory metal-based alloy worked piece having the parent phase consisting of one element selected from Mo, W, and Cr and a nitride-forming metal element selected

from Ti, Zr, Hf, Nb and Ta incorporated into the alloy worked piece as a solid solution to a multistep internal nitriding treatment comprising a stepwise increase of the treatment temperature, col. 3, line 47 to col. 4, line 39.

Takada and the claims differs in that Takada do not specifically teach at least one of carbide particles, oxide particles and boride particles is precipitated and dispersed in the worked piece.

Fukasawa et al teaches adding a metal compound selected from the group consisting of oxides, carbides, borides and nitrides of La, Ce, Dy, Y, Th, Ti, Zr, Nb, Ta, Hf, V, Cr, Mo, W and Mg to molybdenum component improves the strength of molybdenum component at high temperatures, (col. 2, l. 35-44). It would have been to obvious to one skilled in the art to add to the refractory-metal based alloy of Takada et al with the metal compound taught by Fukasawa in order to obtain molybdenum worked piece having enhanced strength at room temperature. It would also be obvious to choose oxide particles, carbide particles and boride particles from the metal compound taught by Fukasawa et al with the expectation that any one of these metal compounds would improve Takada's worked piece properties.

Regarding claim 2, Takada et al teaches at least the surface region of the alloy material has a structure in which nitride particles precipitated in the alloy material have grown with keeping the worked structure of the worked piece (col. 3, l. 36-39).

Regarding claim 3, Takada et al teach when the alloy material is relatively thin, the alloy material may include the worked structure maintained additionally inside the alloy material (col. 3, l. 40-42).

As for claim 4, Takada et al teach when the alloy material is relatively thick, the alloy material may have two-layer structure including a recrystallized structure inside the alloy material (col.3, l. 42-46).

4. Any Inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoclan T. Mai whose telephone number is (571) 272-1246. The examiner can normally be reached on 8:30-5:00 PM Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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